

WHAT IS CLAIMED IS:

1. An audio processing machine comprising:
a plurality of audio inputs;
a plurality of audio outputs;
a plurality of audio filters;
a plurality of audio processing channels; and
a plurality of multiply switches configured to selectively mix the plurality of audio inputs and the plurality of audio outputs such that audio signals passing through the plurality of audio inputs are processed via a plurality of audio filters selected from the plurality of audio filters and a plurality of audio processing channels selected from the plurality of audio processing channels to generate at least one desired audio output signal.
2. The audio processing device according to claim 1 wherein the plurality of multiply switches are comprised of single-cycle multiply switches.
3. The audio processing device according to claim 1 wherein the plurality of multiply switches are comprised of programmable multiply switches.
4. The audio processing device according to claim 3 wherein the programmable multiply switches are reconfigurable on-the-fly.
5. The audio processing device according to claim 1 wherein the multiply switches are further configured to generate a first logic signal to open a conductive path, a second logic signal to close the conductive path, and a third logic signal to open the conductive path while inverting a signal phase associated with an audio signal passing there through.
6. The audio processing device according to claim 1 wherein the plurality of audio filters comprise biquad filters.

7. An audio processing device comprising:
- means for receiving a plurality of audio input signals;
 - means for generating a plurality of audio output signals;
 - means for filtering the plurality of audio input signals to generate a plurality of filtered audio signals;
 - means for processing the plurality of filtered audio signals to generate a plurality of processed audio signals; and
 - a plurality of multiply switches configured to selectively mix a plurality of audio input signals selected from the plurality of audio input signals, a plurality of filtered audio signals selected from the plurality of filtered audio signals and a plurality of processed audio signals selected from the plurality of processed audio signals to generate at least one desired audio output signal.
8. The audio processing device according to claim 7 wherein the plurality of multiply switches are comprised of single-cycle multiply switches.
9. The audio processing device according to claim 7 wherein the plurality of multiply switches are comprised of programmable multiply switches.
10. The audio processing device according to claim 9 wherein the programmable multiply switches are reconfigurable on-the-fly.
11. The audio processing device according to claim 7 wherein the multiply switches are further configured to generate a first logic signal to open a conductive path, a second logic signal to close the conductive path, and a third logic signal to open the conductive path while inverting a signal phase associated with an audio signal passing there through.
12. The audio processing device according to claim 7 wherein the filtering means comprises a plurality of biquad filters.

14. The audio processing device according to claim 13 wherein the plurality of multiply switches comprise single-cycle multiply switches.

15. The audio processing device according to claim 13 wherein the plurality of multiply switches comprise programmable multiply switches.

16. The audio processing device according to claim 15 wherein the programmable multiply switches are reconfigurable on-the-fly.

17. The audio processing device according to claim 13 wherein the multiply switches are configured to generate a first logic signal to open a conductive path, a second logic signal to close the conductive path, and a third logic signal to open the conductive path while inverting a signal phase associated with an audio signal passing there through.

18. A method of processing an audio signal, the method comprising the steps of:
- a. configuring a first plurality of multiply switches, a second plurality of multiply switches and a third plurality of multiply switches;
 - b. mixing a plurality of audio input signals via the first plurality of multiply switches to generate a plurality of mixed audio signals;
 - c. filtering the plurality of mixed audio signals to generate a first plurality of filtered audio signals;
 - d. mixing the first plurality of filtered audio signals via the second plurality of multiply switches to generate a second plurality of filtered audio signals;
 - e. processing the second plurality of filtered audio signals to generate a plurality of processed audio signals; and
 - f. mixing the plurality of processed audio signals via the third plurality of multiply switches to generate at least one desired audio output signal.
19. The method according to claim 18 further comprising the step of reconfiguring on-the-fly, at least one multiply switch selected from the first, second and third plurality of multiply switches and then repeating steps b-f.

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